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**Report Documentation Page** 

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# Real-Time Mobile Applications in Intermittently Connected Networks

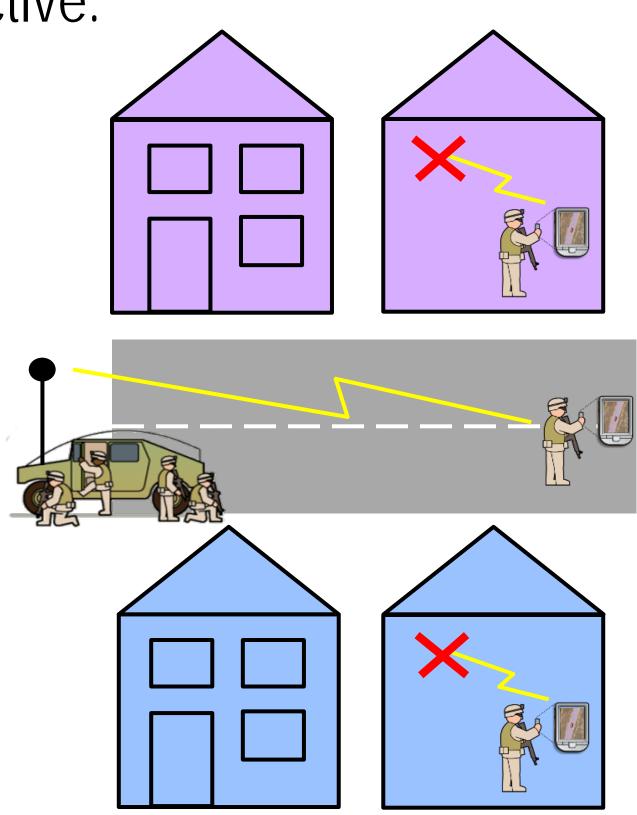
### Problem Statement

#### Problem

- Real-time distributed applications depend on reliable communications.
- Tactical environments are often characterized by disconnected, intermittent and low-bandwidth (DIL) communications.

## To address this problem, we seek to develop methods that

- Enable real-time shared group context in a DIL environment.
- Keep information synchronized in real time despite communication outages.
- Apply group context to make these more effective.



Scenario with Varying Connectivity

#### Approach

#### Keep network users productive

We consider three communication states



#### **Connected State**

Goal	Techniques
Maintain shared group	Pre-cache data likely to
context	be relevant later in the
	mission
Make best use of	Delay transmission of
available bandwidth	noncritical data

#### **Disconnected State**

Applications continue to function	Predict team location based on mission plan
	Provide connectivity
Predict state where	map to help the user
possible	reconnect

### Reconnecting State

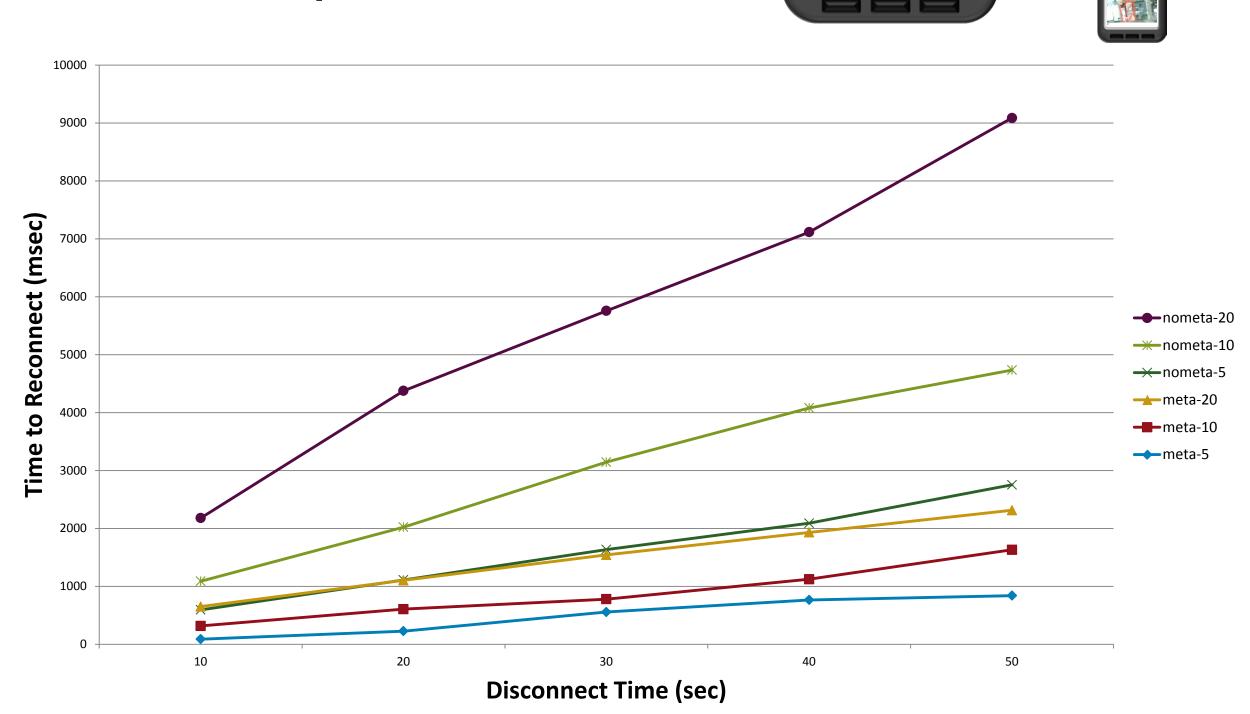
Re-establish shared	Prioritize synchroni-
roup context as	zation of critical
uickly and accurately	messages
s possible	Eliminate redundant
	messages

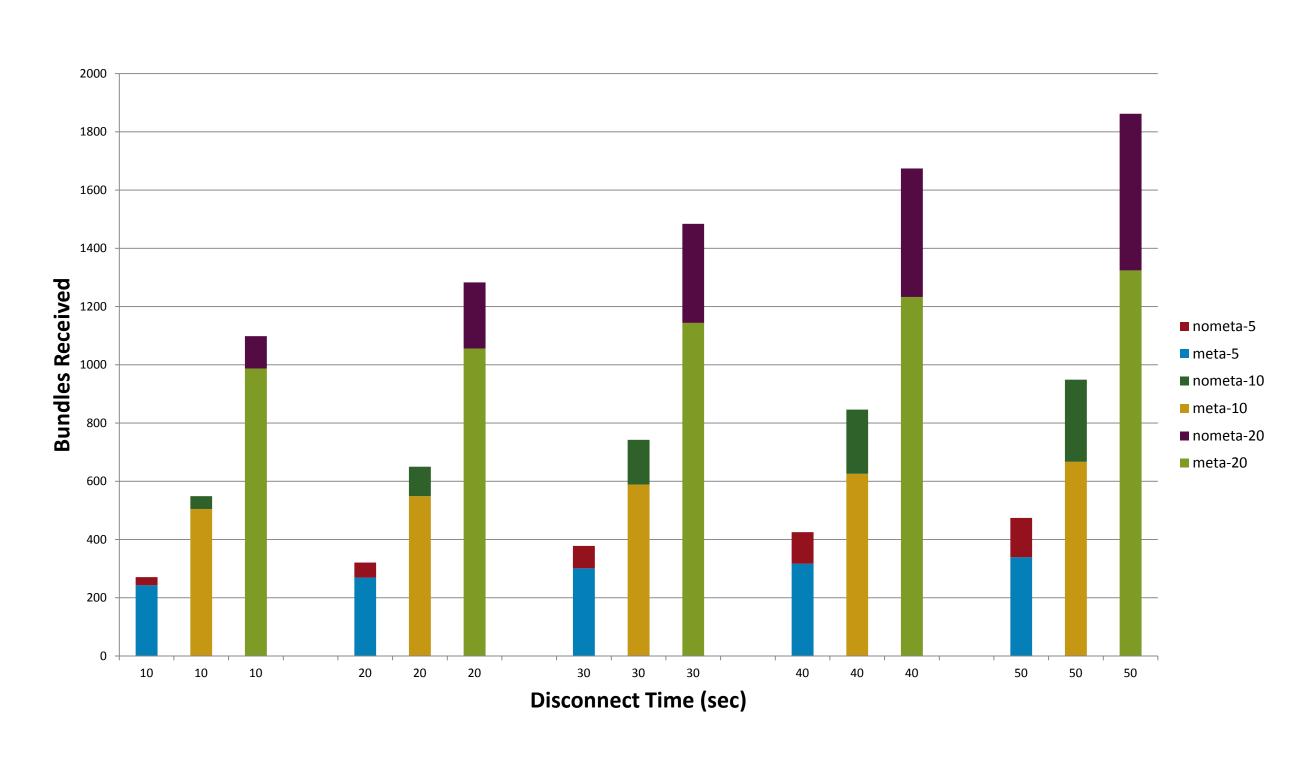
#### Results

#### Implementation: ISE+

- DTN (Delay Tolerant Networking) bundle protocol used for message deliver
- DTN Metadata Extension Blocks

#### Measured Improvements





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